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The Impact of New Terminals on Telecommunications Carriers and TV Media Companies

Abstract :

This paper investigates the impact of new terminals emergence, such as smartphones, tablet personal computers and smart TVs, on telecommunications carriers and TV media companies. We choose event study methodology to analyze this research. Our research question is "Does the emergence of new terminals generate significant impact on the telecommunications carriers and the TV media companies?"

The results show that the impacts of new terminals appear differently on telecommunications carriers and on TV media companies. 1) Regarding telecommunications carriers, some of the smartphones and tablet PCs generate significant positive impact or no impact on smartphone (or tablet PC)-affiliated telecom carriers, but generate significant negative impact on non-smartphone (or tablet PC)-related telecom carriers. 2) Regarding TV media companies, tablet PCs and smart TVs do not generate any significant impact on any researched TV medeia companies.

The results imply some further reasons why the new terminals emergences generate no significant impact on TV media companies. The paper presents three possible reasons. 1) The new terminals are not so powerful that they do not influence TV media companies. 2) The new terminals are sufficiently powerful but their impact does not go to the TV industry. 3) The new terminals are sufficiently powerful but the services by the new terminals do not compete against incumbent TV media services.

JEL codes : L10

Keywords : smartphone, tablet PC, smart TV, telecommunications carrier, TV media company, event study

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Abstract

This paper investigates the impact of new terminals emergence, such as smartphones, tablet personal computers and smart TVs, on telecommunications carriers and TV media companies. We choose event study methodology to analyze this research. Our research question is “Does the emergence of new terminals generate significant impact on the telecommunications carriers and the TV media companies?” The results show that the impacts of new terminals appear differently on telecommunications carriers and on TV media companies. 1) Regarding telecommunications carriers, some of the smartphones and tablet PCs generate significant positive impact or no impact on smartphone (or tablet PC)-affiliated telecom carriers, but generate significant negative impact on non-smartphone (or tablet PC)-related telecom carriers. 2) Regarding TV media companies, tablet PCs and smart TVs do not generate any significant impact on any researched TV medeia companies.

1. Introduction

Until 1990's telecommunications carriers and TV media companies[1] were rarely impacted by the services and companies outside of the industry. However, the Internet services and applications have invaded the territory of telecom and TV media services. We have also witnessed the emergence of new terminals, such as smartphones, tablet PCs and smart TVs, which accelerates the spread of the internet services alternate the incumbent telecom and TV media services.

2. Research Questions and Hypothesis Development

We are interested in the impact of new terminals on the telecommunications carriers and TV media companies. Therefore, our research question is "Does the emergence of smartphones, tablet PCs and smart TVs generate significant impact on telecommunications carriers and TV media companies?"

Our hypotheses of the question are 1) the emergence of smartphones generates significant positive impact on the smartphone-affiliated-telecom-carriers and significant negative impact on the non-smartphone-affiliated-telecom-carriers, 2) the emergence of smart TVs and tablet PCs generates significant negative impact on TV media companies.

3. Methodology

For measuring the impacts of new terminals' emergence, we use the 'event study' methodology.[2] Event study examines the behavior of firms' stock prices when a certain event occurs. If a company gets an impact by a certain event, there should be movements, either positive or negative, on the company's stock returns. Therefore, the change of stock returns indicates the significance of the event's impact on the company. This is the idea of this methodology.

Although there are some previous studies using the event study methodology to measure the impacts on the information companies[3][4][5], there is no study investigating the impacts of the new terminals emergences.

4. Data

First, we select the representatives of smartphones, tablet PCs and smart TVs. Then we research the event date that the each terminal's emergence was announced.[6]

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[1] In this study, we label television network operators and cable television companies as TV media companies.

[2] We employ the methodology from MacKinlay [1997], as presented in Appendix 1.

[3] Trillas [2002] investigates the change of shareholders' value of 12 telecommunications firm acquisitions in Europe.

[4] Zhong, Cao, and Ning [2008] examines the impact of the Telecommunications Act of 1996 on the profitability and efficiency in the broadcasting industry.

[5] Rieck [2010] examines the transformation of the telecom industry through diversification.

[6] We use Reuter's web site for the event date.

In this paper, we chose the terminals produced or affiliated by Apple Inc. or Google Inc. as the representatives of smartphones, tablet PCs and smart TVs as shown in Table 1. This is because Apple's and Google's sales share are high and rising in the smartphone market and they have strong brand recognition on the overall new terminals market.

[Table 1]

Second, we select the telecommunications carriers and the TV media companies as shown in Table 2. Then, we research the each company's stock prices and market indices around the event date.[7]

[Table 2]

Third, we measure the change of each company's stock returns around the event dates, by which we can estimate the impact of each terminal's emergence on each companies.

5. Results

1) The Impact of Smartphones on telecommunications carriers

The results are different between Apple's iPhones and Google's Androids.

Table 3 shows the results of iPhones' impact on telecommunications carriers.

[Table 3]

In summary, some of the iPhone models show significant negative impacts on non-iPhone affiliated-carriers but iPhones do not always show positive impact on iPhone-affiliated-carriers. In other words, iPhone-affiliated-telecom-carriers always get more positive Cumulative abnormal returns (CAR) than non iPhone-affiliated-telecom-carriers, although we do not test them statistically.

Figure 1 is the sample figures showing the impacts of the first iPhone model, iPhone GSM, on the telecommunications carriers.

[Figure 1]

As shown in Figure 1, iPhone GSM does not generate any significant impact on AT&T, an iPhone GSM-affiliated-carrier, but it generates significant negative impacts on Verizon and Sprint Nextel, the non-iPhone GSM-affiliated carriers.

Table 4 shows the results of Androids' impacts on telecommunications carriers.

[7] We use Bloomberg database for stock prices and market index.

[Table 4]

In summary, there are some significant positive or negative impacts on telecommunications carriers, but we can not find any proper rules explaining the impacts by Android models.

2) The Impact of Tablet PCs on telecommunications carriers

Table 5 shows the results of iPads, the representatives of tablet PCs, impact on telecommunications carriers.

[Table 5]

In summary, the results are similar to the results of the first iPhone, iPhone GSM. The results show that iPad and iPad 2 make the significant negative impact on Verizon, a non-iPad-affiliated-carrier, but make no significant impact on AT&T, an iPad-affiliated-carrier.

Figure 2 is the sample figures showing the impacts of the first iPad on telecommunications carriers.

[Figure 2]

3) The Impact of tablet PCs on TV media companies

Table 6 shows the results of tablet PCs' impact on TV media companies.

[Table 6]

In summary, there is not any significant impact by tablet PCs on TV media companies.

Figure 3 is the sample figures showing the impact of iPad on TV media companies.

[Figure 3]

4) The Impact of Smart TVs on TV media companies

Table 7 shows the results of smart TVs' impacts on TV media companies.

[Table 7]

In summary, there are not any significant impacts by smart TVs on TV media companies.

Figure 4 is the sample figures showing the impact of the Google TV announcement on TV media companies.

[Figure 4]

Regarding smart TVs and a tablet PC, neither generates significant impact on TV media companies.

6. Discussion

Regarding telecom carriers, smartphone emergence seems to trigger altering the business model of telecom carriers, from walled-garden to more open one. Consequently, the power in the mobile industry might shift from telecom carriers to mobile OS providers such as Apple or Google.

Regarding TV media companies, there are almost no significant impact by tablet PCs and smart TVs emergence on the incumbent media companies. We think there are three possibilities to explain the result. The first is that the current tablet PCs and smart TVs are not so powerful that they do not change the viewers' behavior from watching incumbent media to online videos and internet contents. The second is that the current tablet PCs and smart TVs are sufficiently powerful but their impact does not go to the TV media industry. The third is that the current tablet PCs and smart TVs are sufficiently powerful and their impact goes to the TV media industry, but they just give viewers the opportunity to watch additional online videos and internet contents to incumbent media, which means the online videos and internet contents by tablet PCs and smart TVs do not compete against incumbent TV media services.

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[Appendix] Process of event study method

First, we describe the stock return and market index return as

$$R_{it}=(P_{it} - P_{it\text{-}1})/ P_{it\text{-}1}$$
$$R_{mt}=(I_t - I_{t\text{-}1})/ I_{t\text{-}1} \ ,$$

where P_{it} represents the stock price of the ith firm at time t, R_{it} signifies its rate of return, I_t stands for market index at time t, and R_{mt} denotes its rate of return. Then we use the market model to specify the normal returns of the security i as

$$R_{it}=\alpha_i+\beta_i R_{mt}+\varepsilon_{it,}$$

where ε_{it} presents the zero mean disturbance term. Based on the estimated parameters α_i and β_i, the abnormal return for the security of firm i in period t is computed as

$$AR_{it}=R_{it} - (\alpha_i+\beta_i R_{mt}).$$

The cumulative abnormal return is calculated as shown below.

$$\text{CAR}(t_1,t_2)=\Sigma AR_{it}$$

Assuming that each event does not affect the mean or variance of returns, we can test whether the average CAR is equivalent to zero using the following t-statistics.

$$t= \text{CAR}(t_1,t_2)/\sigma(t_1,t_2)\sim N(0,1)$$

[Table1] The researched terminals

Smartphone Event Dates				
Model	Event Date (Announcement Day)	Release date in US	Affiliated Telecommunications Carrier	Device Manufacturer
iPhone GSM	1/9/2007	6/29/2007	Cingular Wireless (AT&T)	Apple
iPhone G3	6/9/2008	7/11/2008	AT&T	Apple
iPhone G3S	6/8/2009	6/19/2009	AT&T	Apple
iPhone 4	6/7/2010	6/24/2010	AT&T	Apple
iPhone 4 for Verizon	1/11/2011	2/10/2011	Verizon	Apple
HTC Dream	9/23/2008	10/28/2008	T-mobile USA	HTC
Motorola Droid	10/6/2009	11/6/2009	Verizon Wireless	Motorola
Nexus One	1/5/2010	1/5/2010	T-mobile USA	HTC
XPERIA X10	8/9/2010	8/15/2010	AT&T	Sony Ericson
Tablet PC Event Dates				
Model	Event Date (Announcement Day)	Release date in US	Affiliated Telecommunications Carrier	Device Manufacturer
iPad	1/27/2010	4/3/2010	AT&T	Apple
iPad 2	3/2/2011	3/25/2011	AT&T	Motorola
TV Terminals Event Dates				
Model	Event Date (Announcement Day)	Release date in US	Affiliated Telecommunications Carrier	Device Manufacturer
Apple TV (old)	1/9/2007	3/21/2007	-	Apple
Apple TV (new)	9/1/2010	9/1/2010(pre order)	-	Apple
Google TV	5/20/2010	Depend on Manuf.	-	Logitech, Sony etc.

[Table2] The researched Telecommunications Carriers and TV media companies

Category	Company	Main Stock Market
Mobiel Carrier	AT&T inc. (Former Cingular wireless LLC)	NYSE
Mobiel Carrier	Verizon Wireless.	NYSE (Verizon Communications Inc.)
Mobiel Carrier	Sprint Nextel Corp.	NYSE

Category	Company	Main Stock Market
CATV	Comcast Corporation	Nasdaq
CATV	Time Warner Cable Inc.	NYSE
Satellite	The DIRECTV Group Inc.	Nasdaq
Satellite	Dish Network Corporation	Nasdaq
Network	ABC	NYSE (Walt Disney)
Network	CBS	NYSE

[Table3] The results of iPhone models' impact on telecom carriers

iPhone Models	Telecom Carriers	CAR	t-statistics	significancy
	AT&T	-0.0038	-0.3743	
1. iPhone GSM	Verizon	-0.0219	-2.4694	**
2007/1/9	Sprint Nextel	-0.0657	-3.6905	***
	AT&T	0.0080	0.3251	
2. iPhone 3G	Verizon	-0.0113	-0.9475	
2008/7/11	Sprint Nextel	-0.0325	-0.8741	
	AT&T	-0.0058	-0.3553	
3. iPhone 3GS	Verizon	-0.0057	-0.3560	
2009/6/8	Sprint Nextel	-0.0371	-0.5637	
	AT&T	0.0290	3.8447	***
4. iPhone 4	Verizon	0.0220	2.4155	**
2010/6/7	Sprint Nextel	-0.0350	-0.9159	
5. iPhone 4	AT&T	-0.0359	-5.0178	***
for Verizon	Verizon	-0.0236	-2.7268	**
2011/1/11	Sprint Nextel	-0.0680	-2.8880	**

*** denotes 1%, ** denotes 5%, and * denotes 10% significance level in two-tailed tests.
We set a p-value at a significant level of 5%.

[Table4] The results of Android models' impact on telecom carriers

Android Models	Telecom Carriers	CAR	t-statistics	significancy
	AT&T	-0.0005	-0.0379	
HTC Dream	Verizon	-0.0167	-1.3249	
(T-Mobile USA)	Sprint Nextel	-0.0152	-0.3815	
	AT&T	-0.0294	-2.4747	**
Motorola Droid	Verizon	-0.0317	-2.7318	***
(Verizon)	Sprint Nextel	-0.0806	-2.2244	**
	AT&T	-0.0233	-2.3780	**
NEXUS One	Verizon	-0.0442	-4.3649	***
(T-Mobile USA)	Sprint Nextel	0.1058	2.8159	***
	AT&T	0.0133	1.7843	*
XPERIA X10	Verizon	0.0201	2.0926	**
(AT&T)	Sprint Nextel	0.0107	0.3430	

*** denotes 1%, ** denotes 5%, and * denotes 10% significance level in two-tailed tests.
We set a p-value at a significant level of 5%.

[Table5] The results of tablet PCs' impact on telecom carriers

iPad Models	Telecom Carriers	CAR	t-statistics	significancy
	AT&T	0.0054	0.5246	
1. iPad	Verizon	-0.0383	-3.4671	***
	Sprint Nextel	0.0089	0.2360	
	AT&T	-0.0104	-1.4592	
2. iPad 2	Verizon	-0.0201	-2.2614	**
	Sprint Nextel	-0.0057	-0.2583	

*** denotes 1%, ** denotes 5%, and * denotes 10% significance level in two-tailed tests.
We set a p-value at a significant level of 5%.

[Table 6] The results of tablet PCs' impact on TV media companies

Tablet PC	TV Media company	CAR	t-statistics	significancy
	Comcast(NBC)	-0.0120	-0.7767	
1. iPad	Time Warner Cable	-0.0034	-0.2147	
	DIRECTV	-0.0090	-0.7691	
	Dish Network	-0.0171	-0.8701	
	Disney(ABC)	-0.0070	-0.6229	
	CBS	0.0087	0.2945	
	Comcast(NBC)	-0.0044	-0.3918	
2. iPad 2	Time Warner Cable	0.0007	0.0572	
	DIRECTV	0.0025	0.2914	
	Dish Network	0.0200	1.2530	
	Disney(ABC)	0.0033	0.3194	
	CBS	0.0123	0.9015	

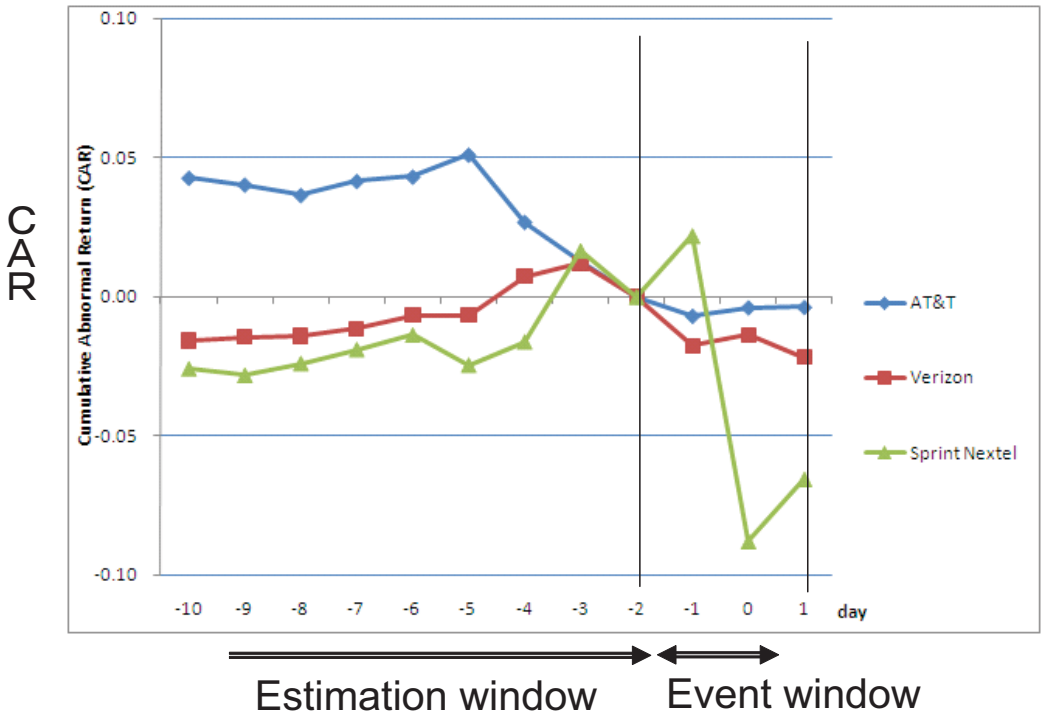
*** denotes 1%, ** denotes 5%, and * denotes 10% significance level in two-tailed tests.
We set a p-value at a significant level of 5%.

[Table 7] The results of Smart TVs' impact on TV media companies

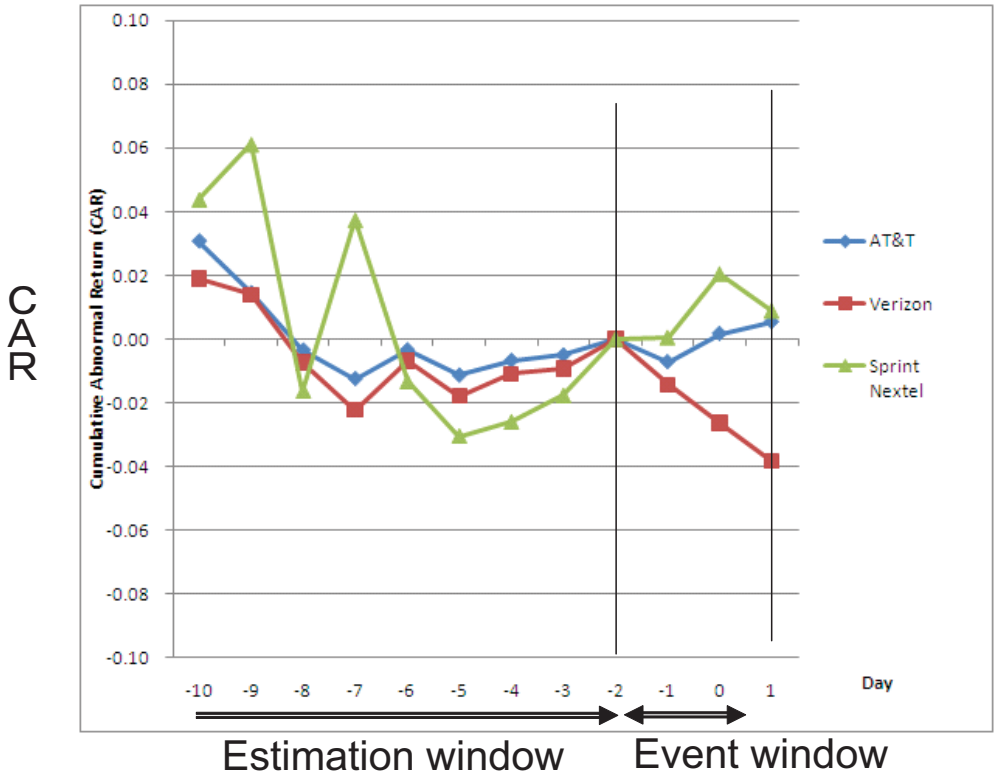
TV terminals	TV Media company	CAR	t-statistics	significancy
	Comcast(NBC)	0.0019	0.1791	
1. old Apple TV	Time Warner Cable	—	—	
	DIRECTV	-0.0233	-1.7553	*
	Dish Network	0.0235	1.5594	
	Disney(ABC)	0.0047	0.4976	
	CBS	0.0046	0.4644	
	Comcast(NBC)	0.0229	1.7159	*
2. New Apple TV	Time Warner Cable	0.0104	0.7379	
	DIRECTV	-0.0196	-1.7505	*
	Dish Network	-0.0067	-0.3739	
	Disney(ABC)	0.0035	0.4005	
	CBS	0.0212	1.4875	
	Comcast(NBC)	-0.0136	-0.9063	
3. Google TV	Time Warner Cable	0.0155	1.0087	
	DIRECTV	-0.0025	-0.2082	
	Dish Network	-0.0336	-1.8742	*
	Disney(ABC)	0.0014	0.1426	
	CBS	0.0121	0.6773	

*** denotes 1%, ** denotes 5%, and * denotes 10% significance level in two-tailed tests.
We set a p-value at a significant level of 5%.

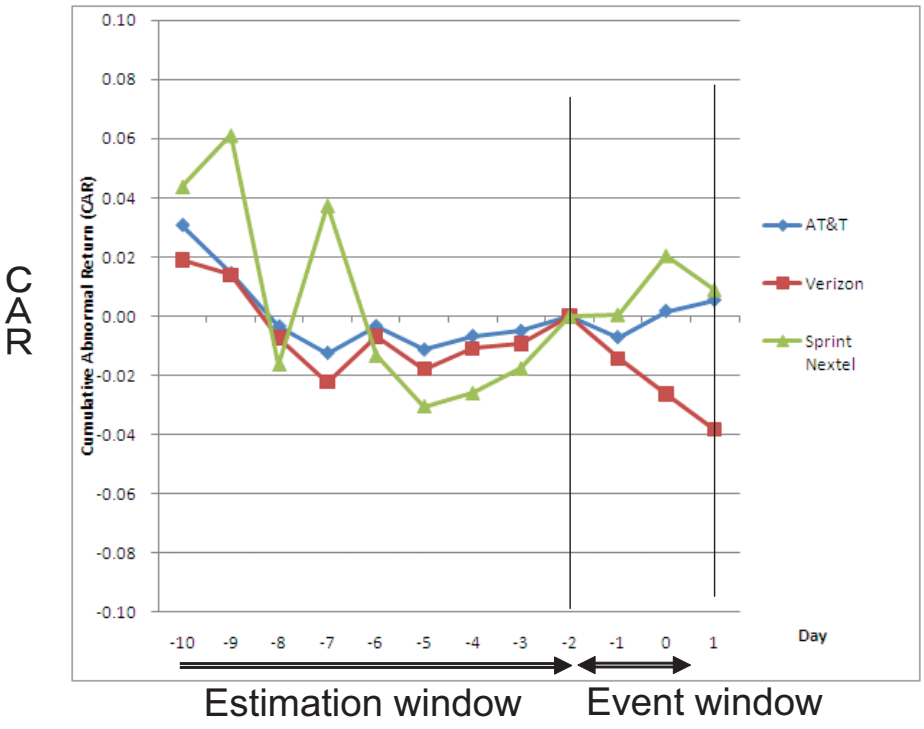
[Figure1] The impact of iPhone GSM on the telecom carriers



[Figure2] The impact of iPad on telecom carriers



[Figure 3] The impact of iPad on TV media companies



[Figure 4] The impact of Google TV on TV media companies